

FORM PTO 1390 (REV 11-2000)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER DNAG 229 - PFF/JRC
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371			U.S. APPLICATION NO. (if known, see 37 CFR 1.5) 10/018921
INTERNATIONAL APPLICATION NO. PCT/EP00/05657	INTERNATIONAL FILING DATES 20 June 2000	PRIORITY DATE CLAIMED 6 July 1999	
TITLE OF INVENTION RELEASE ELEMENT FOR INITIATING PYROTECHNICS			
APPLICANT(S) FOR DO/EO/US Wilhelm BORNHEM, et al.			
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:			
<ol style="list-style-type: none"> 1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371. 2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing 35 U.S.C. 371 3. <input checked="" type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371 (f)). The submission must include items (5), (6), (9) and (21) indicated below. 4. <input type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (PCT Article 31). 5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371 (c)(2)) <ol style="list-style-type: none"> a. <input checked="" type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau). b. <input checked="" type="checkbox"/> has been communicated by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). 6. <input type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371 (c)(2)). <ol style="list-style-type: none"> a. <input type="checkbox"/> is attached hereto. b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4). 7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3)) <ol style="list-style-type: none"> <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau). b. <input type="checkbox"/> have been communicated by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input type="checkbox"/> have not been made and will not be made. 8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)). 9. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)). 10. <input type="checkbox"/> An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)). 			
Items 11 to 20 below concern document(s) or information included:			
<ol style="list-style-type: none"> 11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98. 12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included. 13. <input type="checkbox"/> A FIRST preliminary amendment. 14. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment. 15. <input type="checkbox"/> A substitute specification. 16. <input type="checkbox"/> A change of power of attorney and/or address letter. 17. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825. 18. <input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4). 19. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4). 20. <input type="checkbox"/> Other items or information: PCT/IPEA/416; PCT/ISA/210; PCT/IPEA/409 			

U.S. APPLICATION NO. 10/018921 INTERNATIONAL APPLICATION NO. PCT/EP00/05657	ATTORNEY'S DOCKET NUMBER DNAG 229- PFF/JRC																																																																	
17. <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)): <input type="checkbox"/> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1040.00 <input checked="" type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$890.00 <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$740.00 <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$710.00 <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00 ENTER APPROPRIATE BASIC FEE AMOUNT = Surcharge of \$ <u>130.00</u> for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input checked="" type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).																																																																		
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:20%;">CLAIMS</th> <th style="width:20%;">NUMBER FILED</th> <th style="width:20%;">NUMBER EXTRA</th> <th style="width:20%;">RATE</th> <th style="width:20%;"></th> </tr> <tr> <td>Total claims</td> <td>7-20 =</td> <td>0</td> <td>X</td> <td>\$</td> </tr> <tr> <td>Independent claims</td> <td>1-3 =</td> <td>1</td> <td>X</td> <td>\$</td> </tr> <tr> <td colspan="3">MULTIPLE DEPENDENT CLAIM(s) (if applicable)</td> <td>X</td> <td>\$</td> </tr> <tr> <td colspan="4" style="text-align: right;">TOTAL OF ABOVE CALCULATIONS =</td> <td>\$ 1020.00</td> </tr> <tr> <td colspan="4"> <input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2. </td> <td>\$</td> </tr> <tr> <td colspan="4" style="text-align: right;">SUBTOTAL =</td> <td>\$ 1020.00</td> </tr> <tr> <td colspan="4"> Processing fee of \$ _____ for furnishing the English translation later than <input type="checkbox"/> 20 <input checked="" type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492 (f)). + </td> <td>\$ 130.00</td> </tr> <tr> <td colspan="4" style="text-align: right;">TOTAL NATIONAL FEE =</td> <td>\$ 1150.00</td> </tr> <tr> <td colspan="4"> Fee for recording the enclosed assignment (37 CFR 1.21 (h)). Assignment Must be accompanied by appropriate cover sheet (37 CFR 3.28, 3.31) (_____ per property). + </td> <td>\$ 00</td> </tr> <tr> <td colspan="4" style="text-align: right;">TOTAL FEES ENCLOSED =</td> <td>\$ 1150.00</td> </tr> <tr> <td colspan="4"></td> <td style="text-align: right;">Amount to be Refunded: \$</td> </tr> <tr> <td colspan="4"></td> <td style="text-align: right;">Charged: \$</td> </tr> </table>		CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		Total claims	7-20 =	0	X	\$	Independent claims	1-3 =	1	X	\$	MULTIPLE DEPENDENT CLAIM(s) (if applicable)			X	\$	TOTAL OF ABOVE CALCULATIONS =				\$ 1020.00	<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.				\$	SUBTOTAL =				\$ 1020.00	Processing fee of \$ _____ for furnishing the English translation later than <input type="checkbox"/> 20 <input checked="" type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492 (f)). +				\$ 130.00	TOTAL NATIONAL FEE =				\$ 1150.00	Fee for recording the enclosed assignment (37 CFR 1.21 (h)). Assignment Must be accompanied by appropriate cover sheet (37 CFR 3.28, 3.31) (_____ per property). +				\$ 00	TOTAL FEES ENCLOSED =				\$ 1150.00					Amount to be Refunded: \$					Charged: \$
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a. <input checked="" type="checkbox"/> A check in the amount of \$ <u>\$1150.00</u> to cover the above fees is enclosed. b. <input type="checkbox"/> Please charge my Deposit Account No. <u>50-0624</u> in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed. c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required or credit Any overpayment to my Deposit Account No. <u>50-0624</u> . A duplicate copy of this sheet is enclosed.																																																																		
NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.																																																																		
SEND ALL CORRESPONDENCE TO: James R. Crawford FULBRIGHT & JAWORSKI L.L.P. 666 Fifth Avenue New York, New York 10103 (212) 318-3148 Customer No. 24972																																																																		
SIGNATURE: <u>James R. Crawford</u> NAME: _____																																																																		
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By: Eileen Sheffield

Eileen Sheffield

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : BORNHEIM, et al.
Serial No. : 10/018,921
Filing Date : December 19, 2001
For : RELEASE ELEMENT FOR INITIATING
PYROTECHNICS

April 4, 2002

Hon. Commissioner of Patents
and Trademarks
Washington, D.C. 20231
Box Missing Parts

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to Commissioner of Patents and Trademarks, Washington, D.C. 20231 on April 4, 2002

Eileen Sheffield

Signature

Date

PRELIMINARY AMENDMENT

SIR:

In advance of prosecution, please amend the above-identified patent application as follows:

IN THE CLAIMS:

Cancel claims 1-7 without prejudice and add the following new claims:

8. An electronic releasing device for pyrotechnic igniters having a primary and a secondary charge, wherein the primary charge is ignited by means of a circuit that comprises electronic components and whose essential electronic components are accommodated as an integrated circuit in an IC housing, with the housing being disposed on a printed circuit board, wherein the terminals of the IC housing are provided as connecting points for test instruments for checking the serviceability of the integrated circuit and the igniter function and also serve for connection to external electronic devices for programming the releasing device.

9. The electronic releasing device of claim 8, wherein the chassis grounds of the integrated circuit are brought out at more than one connection point.

10. The electronic releasing device of claim 8, wherein the ignition time steps and the fuse addresses are stored in a memory in the integrated circuit.

11. The electronic releasing device of claim 8, wherein the fuse addresses are disposed in a programming field on the printed circuit board in the form of a predetermined pattern of connections of the conductor tracks to the terminals of the integrated circuit.

12. The electronic releasing device of claim 11, wherein the fuse addresses are indicated in each case by means of a marking on the printed circuit board.

13. The electronic releasing device of claim 8, wherein the meander-shaped conductor track course on the printed circuit board represents a filter for combating high frequencies and, consequently, a protection for the electronic components.

14. The electronic releasing device of claim 8, wherein at least one protective and fuse resistor is soldered on by means of the reflow method.

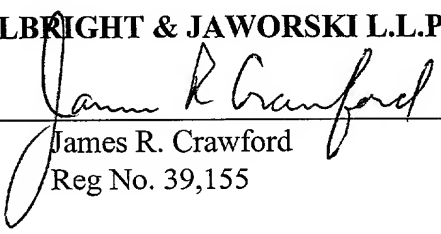
REMARKS

Entry of this amendment is respectfully solicited. If any fee is due to maintain pendency of this application, authorization is granted to charge such fees to Deposit Account No. 50-0624.

Respectfully submitted,

FULBRIGHT & JAWORSKI L.L.P.

By


James R. Crawford
Reg No. 39,155

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Enclosure

Releasing device for initiating pyrotechnic elements

The invention relates to a releasing device for
pyrotechnic elements, such as firing elements, gas
5 generators, belt tighteners, electronic detonators,
etc., in accordance with the preamble of the first
claim.

With electronic pyrotechnic systems, in particular with
10 those that are used in the automotive field and as
electronic detonators, all the functions, such as
overvoltage protection, limiter structures, filtering
properties, address allocations, arming codes and
setting of the delay times are achieved with the aid of
15 a circuit comprising electronic components. The
centrepiece is an integrated circuit in a chip. Due to
the small structure, for example of a detonator, the
chip is mounted in a space-saving manner on a printed
circuit board (PCB) using the so-called CoB (chip on
20 board) technology. The functional reliability of the
circuit and its security with respect to faults are the
most important quality criteria.

This CoB technology has, however, disadvantages that may
25 result in reliability problems. Because of the
relatively sensitive bonding points, damage may occur in
the production process as a result of the mechanical
stress loads encountered during soldering, welding,
punching, joining or shrinking. In the extreme case,
30 these may result in contact open-circuits or unstable
contacts.

For this reason, it is already known to accommodate the
integrated circuits (crystals) in an IC housing (for

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example, SOT). An electronic igniter having a chip in such a housing is disclosed, for example, in EP 0 616 190 A1.

- 5 An object of the present invention is to make releasing units for pyrotechnic systems still more defect-safe and failure-safe by configuring the electronic circuit and providing test possibilities.
- 10 The object is achieved with the aid of the characterizing features of the first claim. Advantageous embodiments of the invention are claimed in the subclaims.
- 15 With conventional CoB technology, the integrated circuit is designed only for previously specified functions. After the chip has been mounted on the printed circuit board, its terminals are inaccessible as a result of coating with a covering composition. As a result, its
- 20 functions can no longer be tested. Individual inputs into the integrated circuit are no longer possible. The encapsulation of an integrated circuit in a housing has the advantage that each of its terminals, in particular the test points, are brought out and are thereby
- 25 accessible. At these terminals, contact points may be provided for testing instruments that enable speeding up of checking of the serviceability of the integrated circuit. The new technology makes it possible to provide a chip that, after its installation, can be loaded via
- 30 the contact points with the appropriate functions provided for use, in particular the fuse address allocations, the arming code and the setting of the delay times. As a result, individual programming of any igniter is possible with respect to its application
- 35 purpose.

In addition, a chip encapsulated in an IC housing offers the possibility for the performance data of the integrated circuit to be capable of being tested at the manufacturer's premises and before installation in the releasing unit, even under climatic conditions. In particular, with guarantee demands imposed on the manufacturer of the IC, the verification duty with faults that occur under cold conditions are very problematical since the crystal surfaces become iced up and an error determination is prevented. In temperature chambers, the serviceability of the integrated circuit can be tested both at low and at high temperatures, and with predetermined atmospheric simulations, such as humidity and dryness. Because of the accessible terminals, that is possible for every integrated circuit prior to installation. As a result, the failure rate that had to be accepted with the installation of previously untested integrated circuits using CoB technology is drastically reduced.

In a further embodiment of the invention, the chassis grounds of the integrated circuit are brought out at more than one connection point. This ensures that a large-area and defined chassis potential is always applied even with defective chassis bonds. Floating chassis potential causes faults. The multiple contacting of the chassis therefore advantageously achieves high immunity, in particular towards high-frequency electromagnetic radiation.

Depending on the nature of the integrated circuit, the fuse addresses and/or functional priorities can be stored in a memory (for example, EEPROM) in the integrated circuit. That is advantageous if the

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releasing unit is programmed only shortly before it is used.

5 If the releasing unit is to be provided only for a certain use for which a fixed programming is provided, for example for a certain fuse address, it may be advantageous if a preset releasing unit is provided separately for every fuse address. In this case, the respective fuse address may be disposed in the form of
10 an already predetermined conductor track pattern on the printed circuit board. This avoids the conventional, expensive cutting of certain conductor tracks (coding) on a so-called programming field on a printed circuit board manufactured in common for all the ignition time
15 steps. The mechanical or thermal cutting of certain conductor tracks, hitherto necessary, to produce certain fuse addresses can result in malfunctions as a result of insufficient cutting or as a result of short-circuits.

20 The corresponding fuse address can already be indicated, in one embodiment of the invention, by a marking disposed on the printed circuit board, for example by a number denoting the fuse address. As a result, the assembly of the releasing device is simplified and
25 interchange of various fuse addresses can be avoided.

Furthermore, it is advantageous if the conductor tracks on the printed circuit board have a meander-shaped course. This makes it possible to filter out high-
30 frequency radiations and thereby to avoid their effect on the integrated circuit.

The invention is explained in greater detail by reference to exemplifying embodiments.

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In the figures:

Figure 1 shows a portion of a releasing unit with the electronic part, the so-called hybrid, and

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Figure 2 shows a portion of a releasing unit according to Figure 1 with a programming field on the printed circuit board for mechanically specifying a delay time of a fuse address.

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Figure 1 shows, on an enlarged scale, the part of a releasing unit 1 in which the hybrid 2, the electronic part, is embedded. The electronic components are disposed on a printed circuit board 3. On the latter can be seen printed conductor tracks 4 that connect the electronic components together and to the two connecting wires of the input 5 and to the two connecting wires 6 of a primer cap not shown here. The printed circuit board 3 may be composed of a particularly bending-resistant material or, alternatively, as in the present case, be embedded in a cured, nonmetallic material 7. The material may be, for example, a plastics material or a casting resin. It surrounds the connecting wires 5 and 6 and the hybrid 2. After the hybrid 2 has been pushed in, the material, while fluid, is poured into the sleeve 8 of the releasing device 1 and cured.

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In addition to the energy-storage capacitor soldered onto the underside of the printed circuit board 3 and therefore not visible here, the printed circuit board 3 contains a protective and fuse resistor 9 and also an integrated circuit 10. The protective and fuse resistor 9 is soldered on by means of the reflow method, which makes possible particularly clean solder joints. The integrated circuit 10 is enclosed in an IC housing 11

and is therefore protected against external effects, in particular against vibrations, such as those occurring with use as detonators in adjacent boreholes (interval ignition). In particular, the fuse address allocation, the storage of the arming code and the setting of the delay times are performed with the integrated circuit 10. The housing 11 of the present integrated circuit 10 has a plurality of terminals, in the case shown 12; six on each side that are connected to the conductor tracks 4 and together. The meander-shaped connections 14a and 14b to the feed conductor 6 to the primer cap, not shown here, are intended to protect against the effect of high-frequency interfering signals.

The terminals 12 brought out of the IC housing 11 make it possible to test the integrated circuit 10 prior to its embedding in the sleeve 8 at its connection points 15. The chassis grounds 16 are brought out of the housing 11 with more than one terminal and are connected together by a conductor track 17.

In addition to testing the integrated circuit 10, the latter can also be provided prior to installation via the connection points 15 with all the important items of information that essentially comprise the fuse address allocation, the arming code and the setting of the delay time, the ignition time step.

The releasing unit 100 in Figure 2 differs from the releasing unit 1 in Figure 1 in that the delay time is not set individually in it, but in that the integrated circuit 10 is set to a fixed delay time and, consequently, to a fixed fuse address.

In accordance with this exemplary embodiment of the invention, a programming field 20 composed of conductor tracks 21 is formed on the otherwise similarly equipped printed circuit board 3. A predetermined pattern for the connection of the conductor tracks 21 to the chassis grounds 16 specifies the setting of a certain delay time and is characteristic of a certain fuse address. Of the conductor tracks 21a to 21f, the conductor tracks 21a, 21c and 21e are connected to the terminals 12, while the conductor tracks 21b, 21d and 21f are open-circuited. This produces a predetermined bit pattern that determines the delay time. No intervention in the interior of the integrated circuit 10 takes place. This is the same for all the fuse addresses. The open-circuiting of the conductor tracks 21a to 21f may be provided as a printed pattern even during the production of the printed circuit boards 3. The pattern of a programming field that is assigned to a certain fuse address can be marked on the printed circuit board 3 by a marking 22 and, in the present exemplifying embodiment, this is the number "6" for the sixth fuse address. Another pattern of connection of the conductor tracks 21a to 21f to the terminals 12 is assigned in each case to another fuse address.

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Patent Claims

1. Electronic releasing device for pyrotechnic
igniters having a primary and a secondary charge,
5 wherein the primary charge is ignited by means of a
circuit that comprises electronic components and
whose essential electronic components are
accommodated as an integrated circuit in an IC
housing, with the housing being disposed on a
10 printed circuit board, characterized in that the
terminals (12) of the IC housing (11) are provided
as connecting points (15) for test instruments for
checking the serviceability of the integrated
circuit (10) and the igniter function and also
15 serve for connection to external electronic devices
for programming the releasing device.
2. Electronic releasing device according to Claim 1,
characterized in that the chassis grounds (16) of
20 the integrated circuit (10) are brought out at more
than one connecting point (15).
3. Electronic releasing device according to Claim 1 or
2, characterized in that the ignition time steps
25 and the fuse addresses are stored in a memory (for
example, EEPROM) in the integrated circuit (10).
4. Electronic releasing device according to Claim 1 or
2, characterized in that the fuse addresses are
30 disposed in a programming field (20) on the printed
circuit board (3) in the form of a predetermined
pattern (code) of connections of the conductor
tracks (21a to 21f) to the terminals (12) of the
integrated circuit (10).

5. Electronic releasing device according to Claim 4, characterized in that the fuse addresses are indicated in each case by means of a marking (22) on the printed circuit board (3).

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6. Electronic releasing device according to one of Claims 1 to 5, characterized in that the meander-shaped conductor track course (14a, 14b) on the printed circuit board (3) represents a filter for combating high frequencies and, consequently, a protection for the electronic components (9, 10).

10

7. Electronic releasing device according to one of Claims 1 to 6, characterized in that at least one protective and fuse resistor (9) is soldered on by means of the reflow method.

15

1001694-04/2002

DECLARATION/POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

RELEASE ELEMENT FOR INITIATING PYROTECHNICS

the specification of which:

() is attached hereto.

(X) was filed on December 19, 2001 as U.S. Serial No. 10/018,921

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

<u>199 30 904.3</u>	<u>Germany</u>	<u>06/07/1999</u>	<u>Yes (X) No ()</u>
(Number)	(Country)	(Day/Month/Year Filed)	Priority Claimed

			<u>Yes () No ()</u>
(Number)	(Country)	(Day/Month/Year Filed)	Priority Claimed

U.S. Priority Applications

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of the application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

PCT/EP00/05657

June 20, 2000

Pending

PCT/EP00/05657
(Applic. Serial No.)

June 20, 2000
(Filing Date)

Pending
(Status patented/pending/abandoned)

(Applic. Serial No.) (Filing Date)

(Status patented/pending/abandoned)

Power of Attorney

I hereby appoint the following attorneys to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: Peter F. Felfe, Reg. No. 20,297; Norman D. Hanson, Reg. No. 30,946; John A. Bauer, Reg. No. 32,554; James R. Crawford, Reg. No. 39,155; Andrew Im, Reg. No. 40,657, and David Rubin, Reg. No. 40,314, my attorneys with full power of substitution and revocation. Address all telephone calls to James R. Crawford, (212) 318-3148. Address all correspondence to James R. Crawford, Esq. at

FULBRIGHT & JAWORSKI L.L.P.
666 Fifth Avenue
New York, NY 10103

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

(1) Wilhelm BORNHEIM
Full Name/Sole or First Inventor

Signature

Date

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Citizenship: German

Post Office Address: same

(2) Jan PETZOLD
Full Name/Second Inventor

Signature

Date

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Citizenship: German

Post Office Address: same

3-00

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4-00

(4) Ulrich STEINER [Signature] 13.02.2002
Full Name/Fourth Inventor Signature Date

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Post Office Address: same

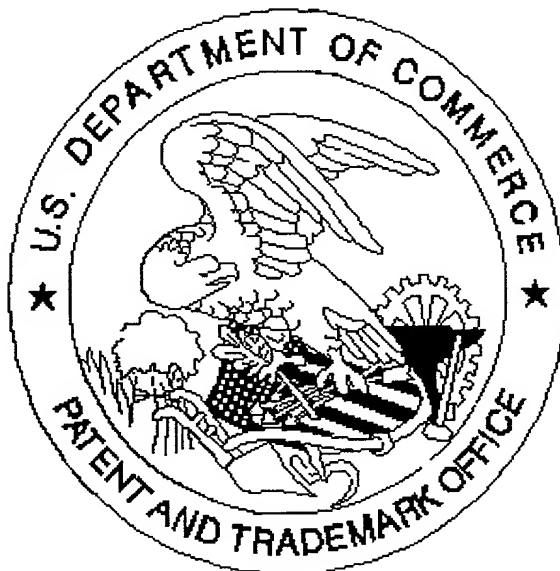
1001331-0412001

(5) Jürgen ZIMMERMANN [Signature] 12.2.2002
Full Name/Fifth Inventor Signature Date

Residence: Altenrather Strasse 2c Citizenship: German
D-53840 Troisdorf, Germany DEX

Post Office Address: same

United States Patent & Trademark Office
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Application deficiencies found during scanning:

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